

Series name : GPSA-1000-24P series

Scope

This specification applies to Embedded type DC stabilized power supply, GPSA-1000-24P-****. All items of this specification shall be provided at normal temperature and humidity unless otherwise specified.

Model name coding

Ex : GPSA-1000-24P-TES

- ① Series name
- ② Continuous output power...1000 : 24V output 1014W Continuous, 1328W Peak(AC115V), 2022W Peak(AC200V)
- ③ Output voltage...24 : 24V
- ④ Peak output compliant
- ⑤ Signal Interface...T : TTL signal G or N : Not available
- ⑥ FAN direction...E : Exhaust I : Intake
- ⑦ Modification No...S : Standard
- ⑧ Coating : C

General specification (Provided at normal temperature and humidity unless otherwise specified)

Items		Specifications	Measurement conditions, etc.
AC input	Rated voltage	AC100-240V (1328W Peak:AC115V) AC200-240V (2022W Peak:AC200V)	Worldwide range
	Voltage range	AC 85-264V	*1
	Rated frequency	50/60 Hz	Frequency range: 47-63HZ
	Input current	11A max. at AC115V, 5.3A max. at AC240V	at continuous max. output
		15A max. at AC115V, 10.6A max. at AC240V	at peak output
	Inrush current	30Apeak max. (primary inrush current) 40Apeak max. (secondary inrush current)	*2 at continuous rated input/output. at cold start(25°C)
	Efficiency	88% typ. at AC115V, 91% typ. at AC240V	at continuous rated output
Power factor	94% min. at AC115V, 90% min. at AC240V		
Environment	Operating Temp./Humidity	-10 ~ 70°C / 10 ~ 90%RH	*3 no condensation
	Storage Temp./Humidity	-25 ~ 75°C / 10 ~ 95%RH	no condensation
	Vibration	To endure in each direction of X,Y, and Z under the condition of a rate of acceleration 2G, 10 to 55Hz of vibration, and 10 sweep cycles for 10 min.	To follow JIS-C-60068-2-6 at no operation
	Mechanical shock (Surface drop)	Lift one bottom edge 50mm high with the opposite edge placed on a test bench, and left it fall. Repeat 3 times in order three edges as well and no malfunction shall be observed.	To follow JIS-C-60068-2-31 at no operation
Insulation	Insulation resistance	50MΩ min. between Input-Output, Input-FG, and Output-FG for each.	at 500V DC
	Dielectric strength	3.0kV AC for 1 minute between Input and Output. 2.0kV AC for 1 minute between Input and FG.	at mass production: 1sec. each. Cut-off current: 15mA
	Leakage current	0.5mA max. at AC115V, 1.0mA max. at AC240V	


Note:

- *1: Follow the derating figure on page 4 for 85-105V AC input.
- *2: Inrush current less than 100 μs in input noise filter section shall not be specified.
- *3: Follow the derating figure on page 4 for ambient temperature over 50°C.




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Items		Specifications	Measurement conditions, etc.
EMS/EMI	Line noise immunity	±2000V(Pulse width:100/1000nS,Cycle period:30-100Hz, Normal/Common mode: Positive/Negative 10 minutes for each)	There shall be no fluctuation in DC-component of output or no malfunction.
	Surge immunity	IEC-61000-4-5installation environment class 3 compliant. Common mode:±2kV, Normal mode:±1kV 5 times for each.	There shall be no malfunction or no failure.
	Conducted emission	VCCI, FCC, CISPR22 and EN55022 Class B compliant	To be measured with power supply single body.
	Electrostatic discharge immunity	IEC61000-4-2 test level 3 compliant Contact discharge : 10 times at±6kV	There shall be no malfunction of output voltage and all signals. There shall be no failure.
	Harmonic current regulation	IEC61000-3-2(Ed.2.1)Class A, To meet EN61000-3-2(A14) Class A.	at rated input and continuous output
Others	Safety standard	UL60950-1,CSA22.2 No60950-1(c-UL) CCC Class A,CE marking(IEC62368-1) 	
	Cooling system	Forced air cooling with thermal sensing fan equipped.	
	Dimensions/Weight	128(W)×61(H)×240(D)/ 1.95kg typ.	Expect protrusions. Refer to an outline drawing in another sheet.
	Reliability grade	FA	To follow our standard.
	Lifetime expectancy	10 years min. (Short life expectancy components: Electrolytic capacitors and fan motors)	Life time expectancy when the unit continuously operates with 115V AC input and rated load at 25°C of ambient temperature.
	MTBF	90,000 hours	Calculation is based on EIAJ RCR-9102.
	Environment	RoHS compliant	
Warranty	Three years after delivery. However, if defects belong to us, the defective unit shall be repaired or replaced at our cost.	The unit shall be operated at normal temperature and humidity. Except wrong operation out of specification	

Note:



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Output Specification						
Items		Specification		Measurement conditions, etc.		
		GPSA-1000-24P	12VSB			
Output rating	Rated voltage		24V	12V		
	Minimum current		0A	0A		
	Continuous rating	Current (100VAC)	37.8A	0.5A	Continuous rating. Refer to the output derating on page 4.	
		Current (115VAC-AC240V)	42A			
		Power (AC100V)	907.2W	6W		
		Power (AC115V-AC240V)	1008W			
	Peak rating 5sec.max.	Current (AC100V)	49.5A	-		Duty ratio is max. 35% for repetitive rating. Refer to the figure below and the duty ratio vs. peak output power on the next page.
		Power (AC100V)	1188W	-		
		Current (AC115V)	55A	-		
		Power (AC115V)	1320W	-		
Current (AC240V)		84A	-			
	Power (AC240V)	2016W	-			
Output characteristics	Voltage setup at factory		24V±2%	12V±5%	at continuous rated output	
	Voltage adjustable range		24V±10%	-		
	Static input fluctuation		96mV max.	120mV max.	Measurement point shall be output terminal block.	
	Static load fluctuation		150mV max.	600mV max.		
	Time-lapse drift		96mV max. at 25°C	120mV max.		
	Total fluctuation		±5% max.			
	Ripple voltage	0 - +70°C	120mV max.		Connect two wires of 100cm max. in length with a 47uF electrolytic capacitor and a 0.1uF ceramic capacitor connected to the others ends to the output terminal block to measure with a 100MHz oscilloscope.	
		-10 -0°C	160mV max.			
	Spike noise voltage	0-+70°C	150mV max.			
		-10-0°C	180mV max.			
Protection	Over current protection	OCP point	101% min. of rated peak current.		Automatically shuts down with more than 5 sec. of peak rated current.(Recovery: Recycling of AC input)	
		Method	Hold-down	Hold-down		
		Recovery	Automatic recovery	Automatic recovery		
	Over voltage protection	OVP point	Vout (settled output voltage)*1.1-1.3	-	Output voltage follow-up type.	
		Method	Output shutdown	-		
		Recovery	Recycling of AC input	-		



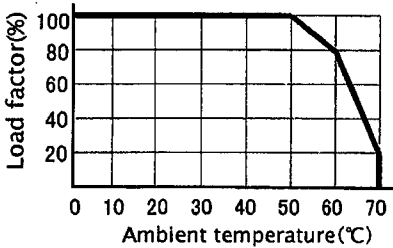
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Output derating specification

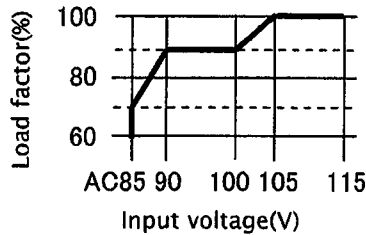
Ambient Temperature Derating

When the ambient temperature near the airflow inlet exceeds 50°C follow the curve below to derate rated current/power, continuous max. current/power, and momentary peak current/power.



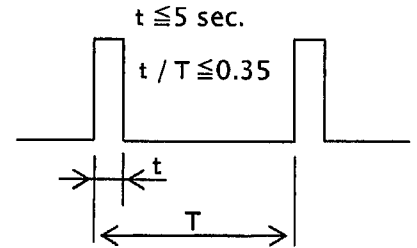
Low Input Voltage Derating

When input voltage is AC 105V or less, follow the derating curve below to derate rated current/power, continuous max. current/power, and momentary peak current/power.



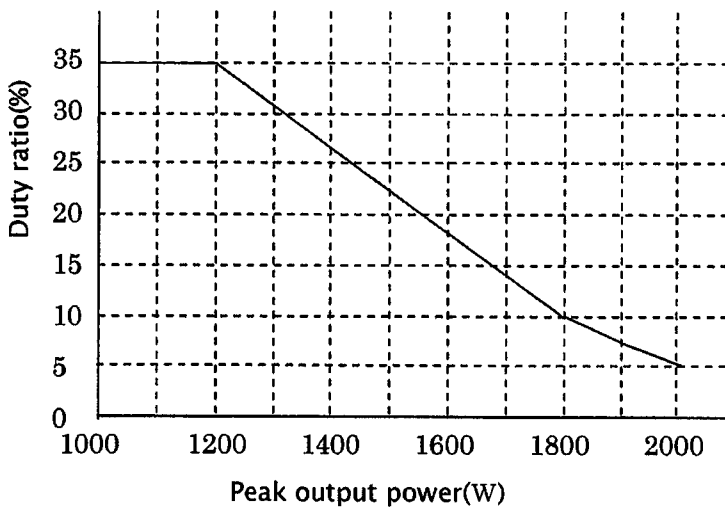
Duty ratio of momentary peak current and power

The duration of momentary peak current/power shall be 5 sec. max. and the duty ratio at repetitive use shall be 35% or less. Average power is 800W max. at peak load.(except 12VSB)



Peak output power condition

Duty ratio vs Peak output power



Please refer to the chart in the left, and follow them of Duty ratio condition for peak output power.

Please keep the average output power under 800W in use of peak output power, which exceeds continuous rating power (1000W).

Note



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Signal input/output specification			
Items	Specification	Signal input/output circuit	
Input signal	<p>Output ON/OFF control signal (PS_ON)</p> <p>Operation mode: Power supply starts up at 'L' input. Power supply shuts down at 'H' or 'OPEN' input. (except 12VSB)</p>	<p>12VSB 22kΩ typ. 1.5kΩ typ. Signal input terminal 1mA max.</p> <p>('L' ≤ 0.8V, 2.0V ≤ 'H')</p>	
Output signal	<p>PWR_OK signal</p> <p>'H' is delivered when output is normal. (Detection delay time: 100~500ms) Detection voltage: 19.9V min. for 24V output.</p>	<p>30V max. Signal output terminal 10mA max.</p>	
	<p>Fan monitoring signal (FAN_M)</p> <p>Two pulses per rotation of individual fans are delivered in square wave. This output is Open-collector.</p>	<p>15V max. Signal output terminal 10mA max.</p>	
	<p>Blackout detection signal (AC FAIL)</p> <p>This signal goes to "OPEN" when AC input lowers or power failure is detected. Detection voltage: 80V AC or less. Detection delay time: 20~40ms after AC failure. At rated input and load.</p>	<p>12VSB 22kΩ typ. 22kΩ typ. Signal output terminal 4mA max.</p>	



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Signal connector pinout table

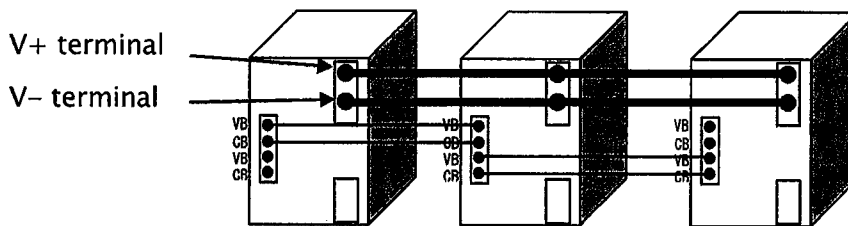
Connector name	Pin No.	Output(signal)name	Max. current/pin	Note
SIG	1	COM	0.6A	Common with output GND
	2	FAN_M	10mA	
	3	N.C.	-	
	4	PS_ON	10mA	
	5	PWR_OK	10mA	
	6	AC FAIL	4mA	
	7	N.C.	-	
	8	12VSB	0.5A	

Note 1:

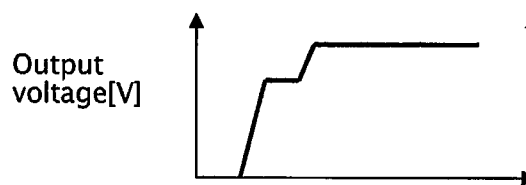
When the Pin 1 'COM' of SIG connector is used, main output current shall not flow into this pin.

Parallel operation

- Can be used with three units in parallel.
- Please wire power supply with same impedance of load wire which connects each power supply. (Recommended: Thickness min. 1mm, width min. 8mm cupric bar to connect V+ terminal and V- terminal of each power supply.)
- Connect each output terminal at parallel operation, output voltage balance(VB), and output current balance(CB)signal.(Refer to the appearance diagram for each output terminal)
- Parallel operation is not available for 12VSB.
- Please set the voltage adjustment volume(s) of sub power supply(-ies), maximum to the left(min. voltage) in order to set the voltage of whole with the master power supply voltage adjustment volume.



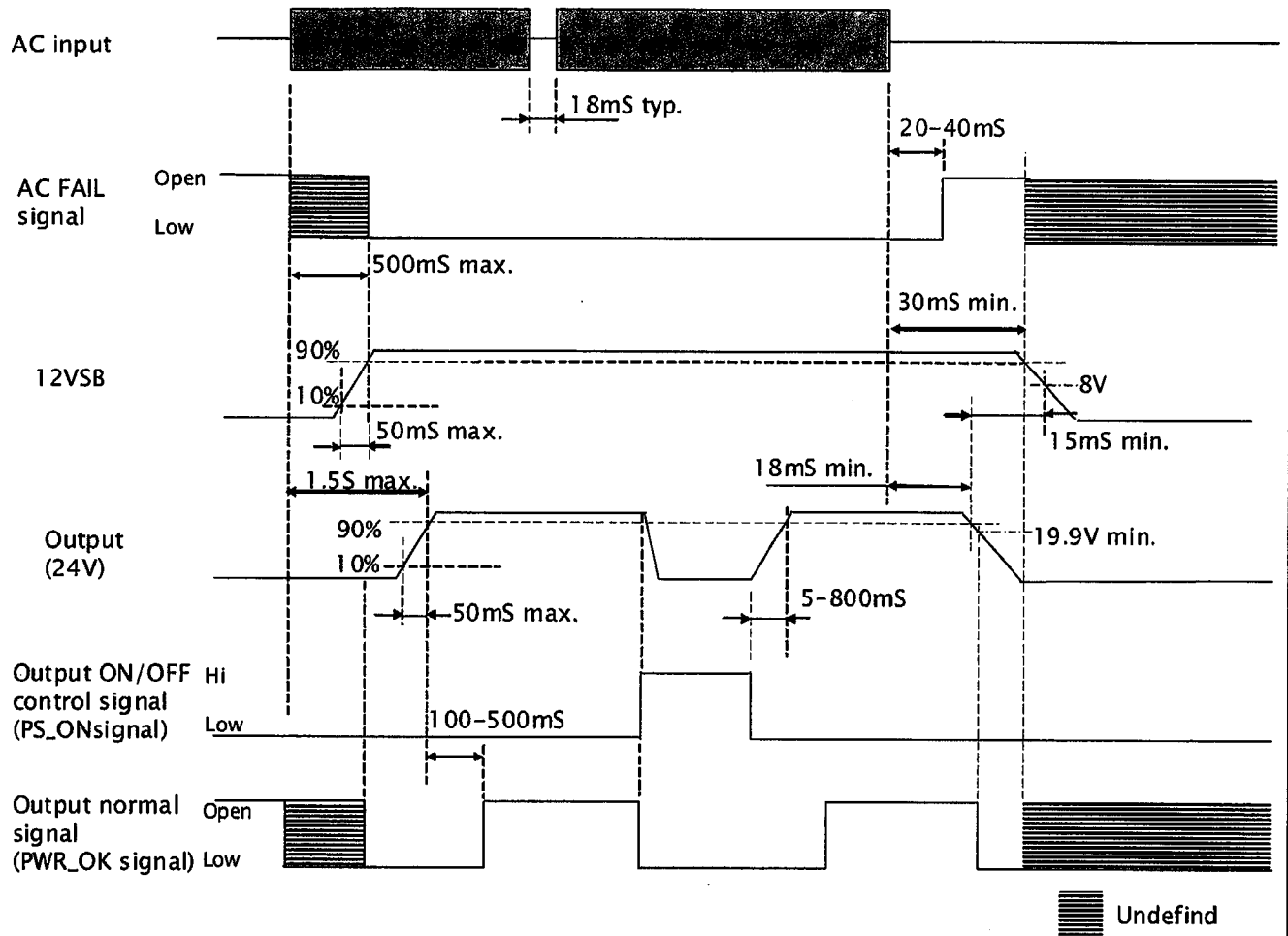
- Max. output current at parallel operation calculated with the formula below.
"Rated current for each output CH × Number of connection CHs × 90%"
- Starting output voltage can be stepping up at parallel operation, as the output CHs start up in erratic pattern.
- Please connect power supplies with AC input shut-down condition.
- Please turn ON/OFF AC voltage or input PS_ON signal at the same time for all parallel power supplies.AC
- Please set min. output current following the formula below.
More than 5% of "Number of units connected × Rated current".(Ex. More than 4.2A when connecting two units in parallel)



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● **Sequence timing diagram**



Note 1: At rated input and load

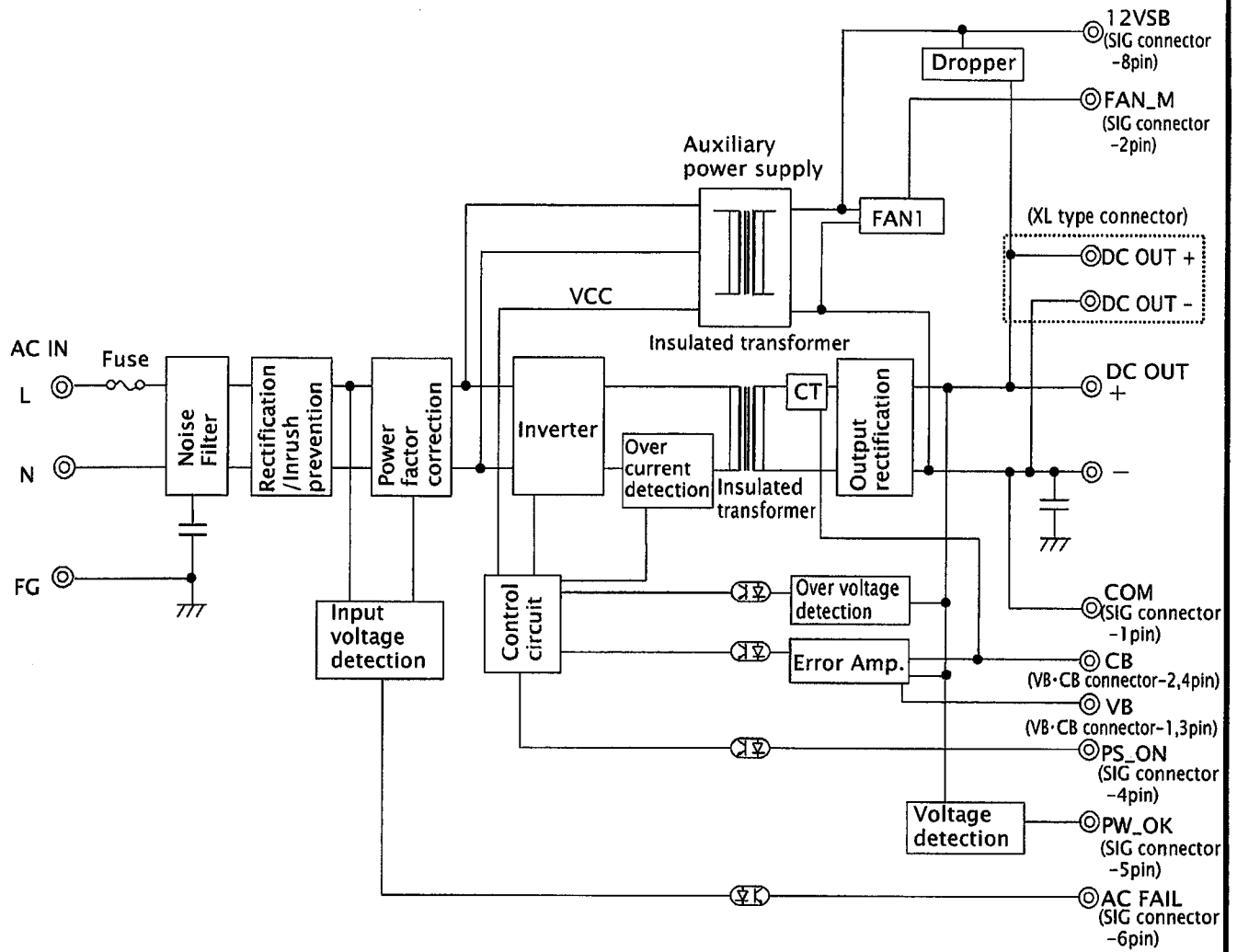


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Due to the technical improvement, the specifications and functions are subject to change without notice.

●Circuit diagram



Note



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Precaution before use

1. Grounding ⚠ Warning

This unit is designed and manufactured as Class I equipment.

For safety, make sure to connect the grounding terminal to the ground in a proper way before use.

2. Electrical Shock ⚠ Warning

The unit is designed and manufactured as embedded type equipment. Make sure to install into the system to prevent electrical shock as it has high voltage portion inside.

3. Output shortage circuit ⚠ Caution

Prevent the output terminals from being shorted. When the output terminals shorted, capacitors inside the power supply may discharge instantaneously leading to serious accidents such as sparks or fire, and shorted the lifetime of the unit.

4. Inrush current limiting circuit ⚠ Caution

Thermal fusing resistor is used in the unit to limit the surge current into smoothing capacitors when AC input is turned on. If input voltage is turned on and off repetitively in a short period of time, the fuse may be broken. Make sure to keep 60 seconds or more before recycling the input voltage.

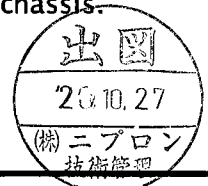
5. Output energy ⚠ Caution

Operators shall not touch the unit as the output energy level of the unit is regarded as dangerous (240VA or more). Also, pay attention to prevent service engineers or tools at maintenance from accidentally touching the output terminals of this unit after installation into the system.

Make sure to confirm that the input and output voltages have lowered enough after the input is turned off before maintenance.

Mounting screws of the unit and grounding

- Use 4mm diameter screws in mounting the power supply.
- Make sure to connect FG terminal of the input terminal to the grounding of the chassis.

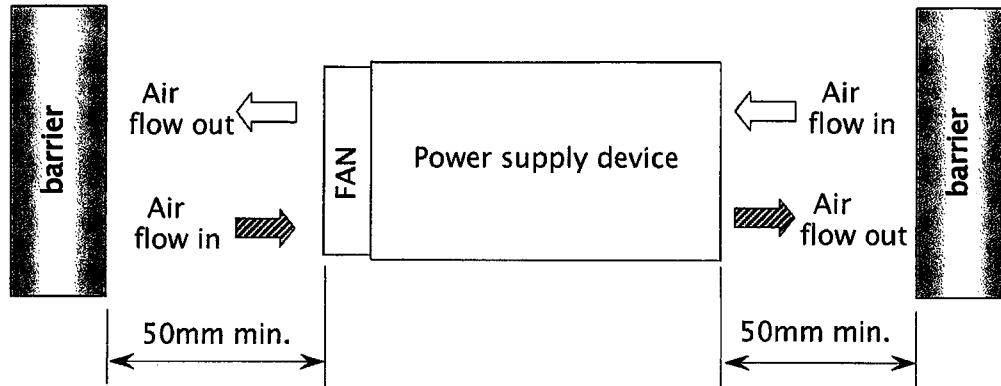


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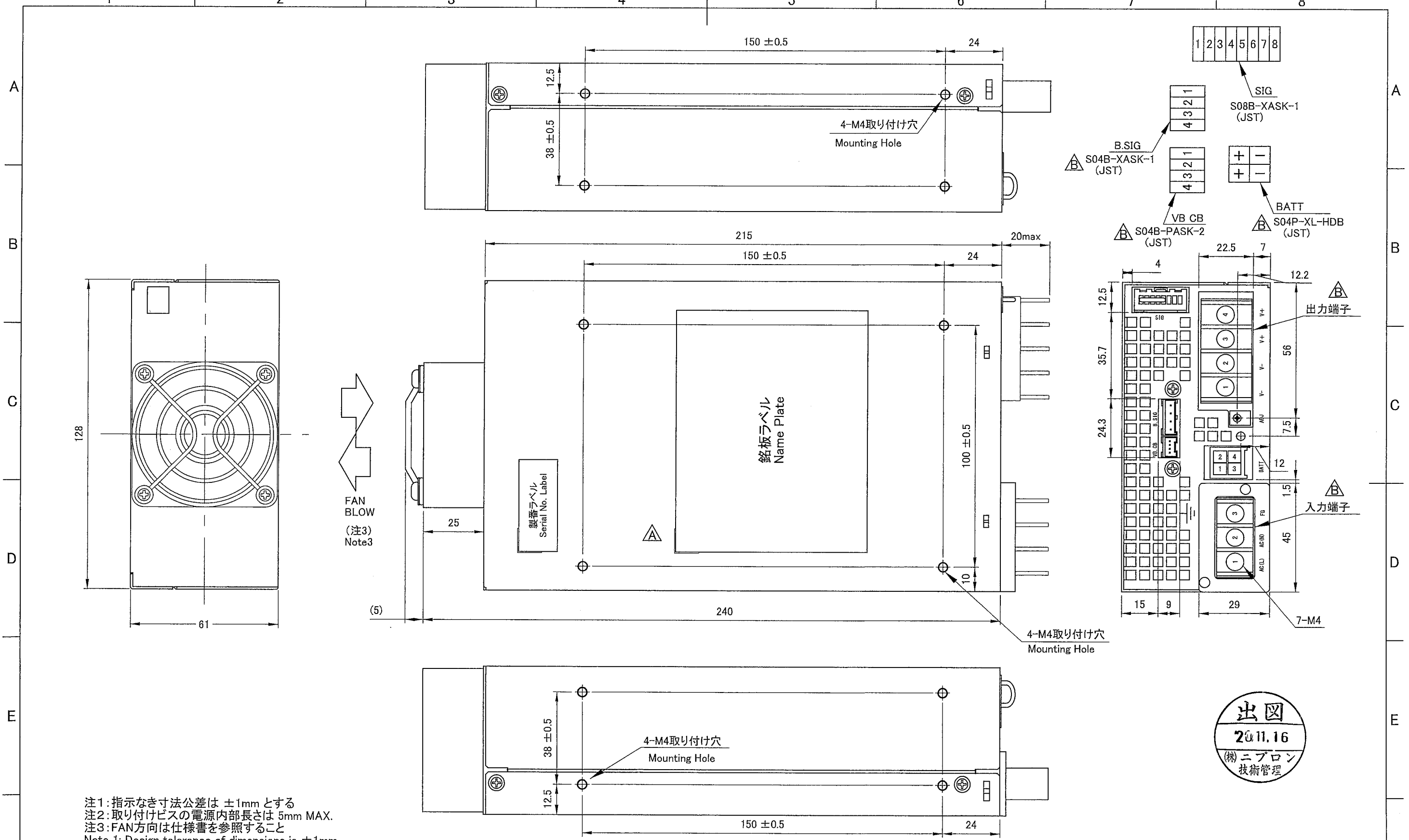
Installation requirements

1. Install power supply device to keep more than the measurement that shows the below away for keeping the Air flow space from the barrier.
2. Install power supply device at the certain environment where air flow in/out space should be kept the temperature not more than max. operating temperature.



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注1: 指示なき寸法公差は ±1mm とする
 注2: 取り付けビスの電源内部長さは 5mm MAX.
 注3: FAN方向は仕様書を参照すること
 Note 1: Design tolerance of dimensions is ±1mm.
 Note 2: The screw depth of penetration into power supply is 5mm MAX.
 Note 3: FAN direction to see the specification.



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 A版 \triangle × 1 2020.9.17 辰巳(由) I-320912 銘板サイズ変更

DRAWN BY	CHECKED BY	CHECKED BY	APPROVED BY	SCALE	MATERIALS	TITLE	DRAWING NO.
西	西	—	辰巳	1/1	—		
ISSUED				2015.05.20	UNITS	FINISH	3480-01-3-050
					m/m		
				3RD ANGLE PROJECTION	—		B